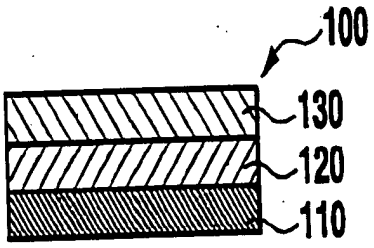
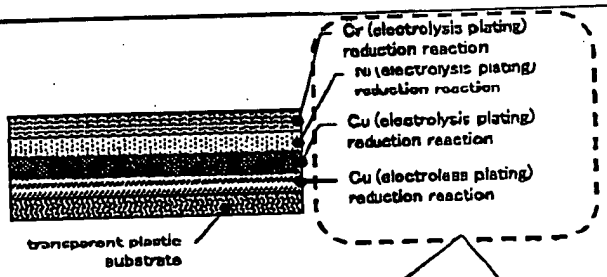
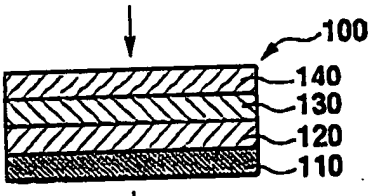
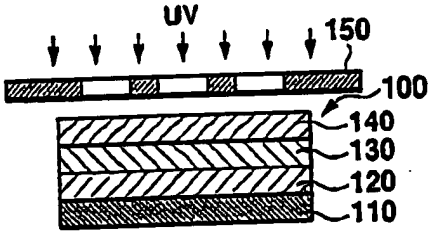
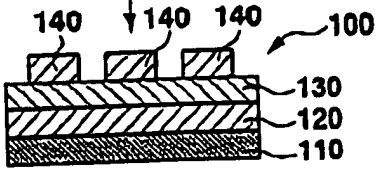
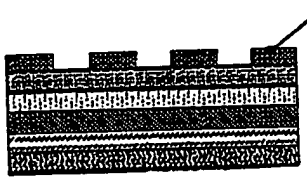
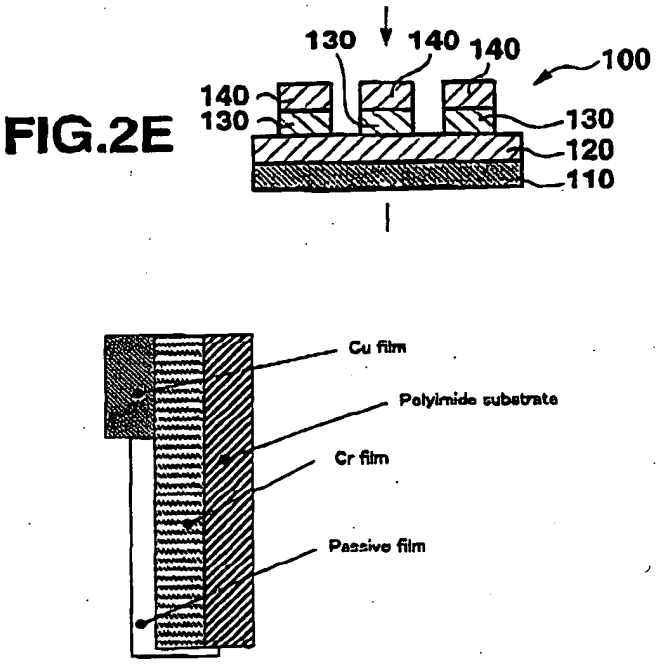
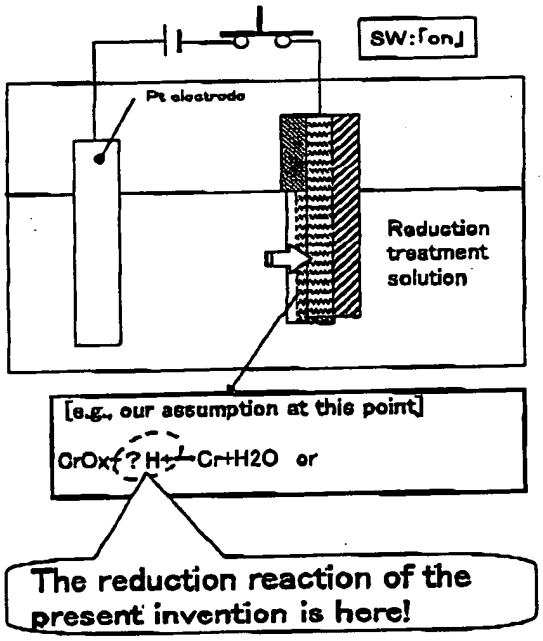
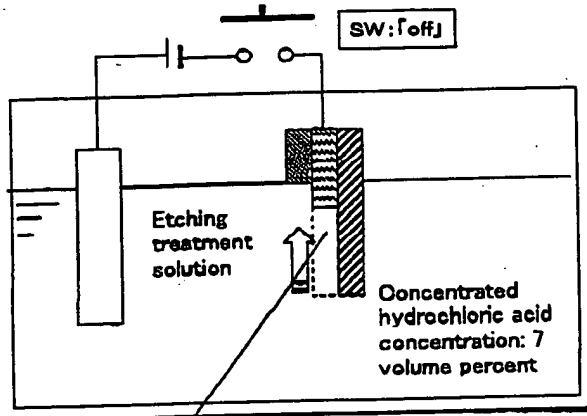
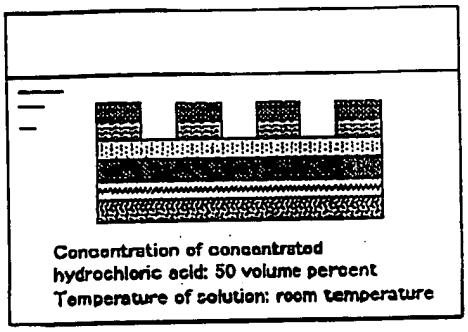
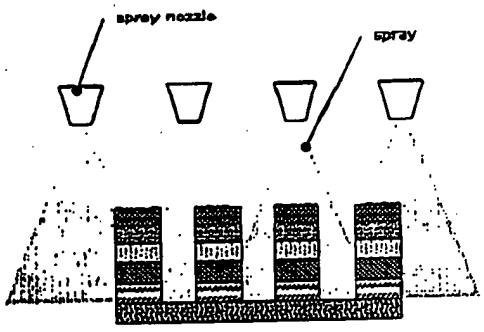
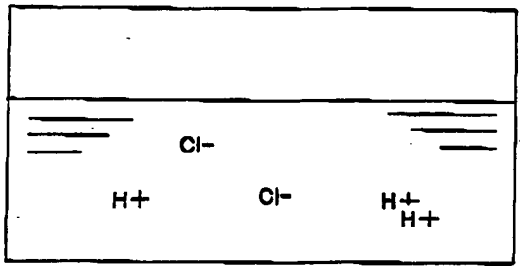
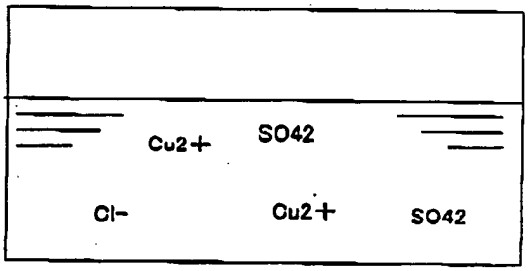
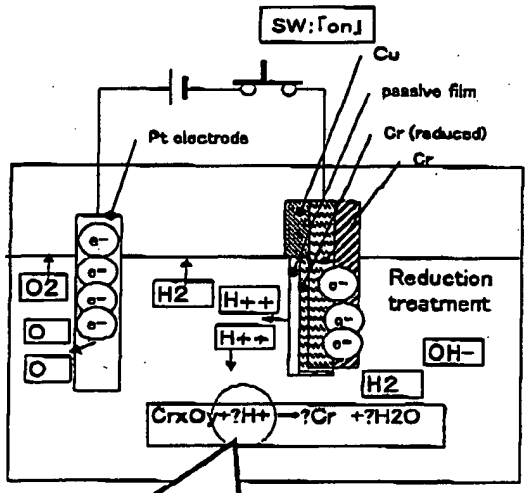
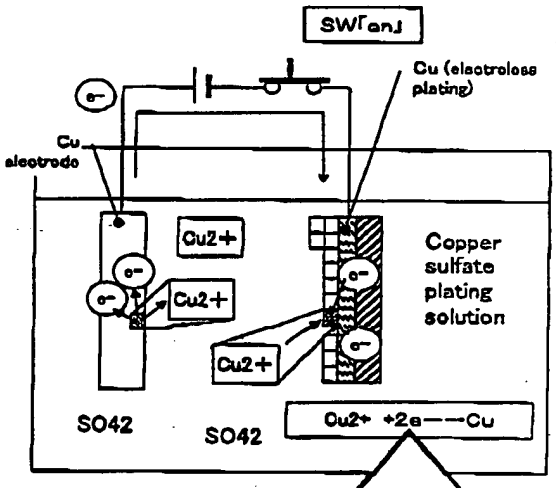
Attachment 1 Comparison between the present application and USP809

	Invention of the present application	USP809
Invention	The present invention is a chemical treatment method by which a metal film formed on a material to be subjected to film formation is etched into a predetermined pattern.	This invention relates to metal plating plastics, and more particularly to an improved method of metal plating transparent acrylic plastic materials such as polymethyl methacrylate
Object	It is an object of the present invention to provide a chemical treatment method capable of easily etching metals, particularly chromium, unsuited to etching, and a chemical treatment apparatus using this chemical treatment method.	An object of this invention is to provide an improved method for adherently metal plating transparent acrylic plastics such as polymethyl methacrylate. A further object is to provide an improved method for selectively adherently metal plating transparent acrylic plastics such as polymethyl methacrylate.
Structure of the subject substrate	FIG.2A 	 The Examiner indicated and cited this reduction reaction.
Resist patterning	FIG.2B  FIG.2C  FIG.2D 	Descriptions regarding resist patterning in USP809 USP809 col. 3, lines 27-36 A photosensitive coating, a resist, is then applied to the chromium plated surface by brushing, spraying or the like. One photosensitive coating which can be used is Dynachem 3140. The photosensitive coating is selectively exposed through a pattern mask and the resultant pattern developed. This leaves an etch resist mask selectively on the metal surface of the plated substrate, corresponding to the metal pattern desired. 

	Invention of the present application	USP809
Cu etching	 FIG.2E	
Removal of Cr passive film (reduction reaction)		

	Invention of the present application	USP809
Cr etching (oxidation reaction)	[e.g.] After carrying out cathode electrolysis reduction for a predetermined time, the electrolysis reduction is stopped.  [Chromium metal layer] $2Cr + 2HCl \rightarrow 2CrCl + H2\uparrow$ [Hydrochloric acid concentration of the present invention] In the experiment data, the hydrochloric acid concentration of the chemical treatment method of the invention of the present application is SAS 5–100 volume percent (about 0.7–14 volume percent when converted into concentration of concentrated hydrochloric acid).	 Concentration of concentrated hydrochloric acid: 50 volume percent Temperature of solution: room temperature [Hydrochloric acid concentration of USP809] USP809 (col. 3, lines 34–37) discloses "The substrate is then immersed for about 2 minutes in a room temperature aqueous solution containing 50 volume percent concentrated hydrochloric acid".
Cu/Ni etching (oxidation reaction)		

Attachment 2 Comparison of reduction reaction

	Present application	USP809
treatment solution	reduction treatment solution  Cations can be of a metal type which does not form a metal film of Na, K, and the like, or ammonium ions which are non-metal. The present invention does not include metal ions which are reduced by a cathode to form a film.	copper sulfate plating solution  It is essential that the ion of the metal to be deposited is included in the solution. The object of including halogen in the plating solution is to provide the solution with favorable conductivity, or to make the dissolving of the anode (copper in a case of copper plating) easy.
cathode reduction reaction	 The reduction reaction of the present invention is here!! Oxygen is taken from chromium oxide by nascent hydrogen, and chromium oxide is reduced to chromium. Oxygen is taken from chromium oxide by "nascent hydrogen" produced when carrying out cathode electrolysis reduction to a passive film on a Cr surface, and chromium oxide is reduced to chromium.	 In the reduction reaction of USP809 which has been indicated and cited by the Examiner, Cu ions obtain electrons, and are reduced to metal. In cathode reduction during copper electroplating, copper ions in the copper plating solution receive electrons on the surface of the cathode, and are reduced to copper.

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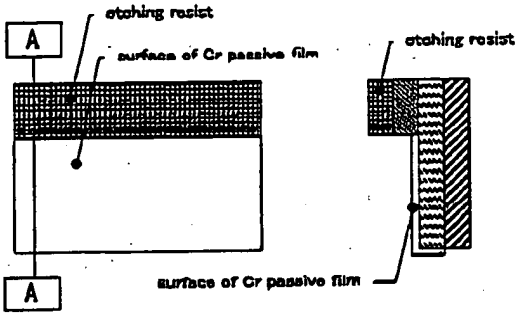
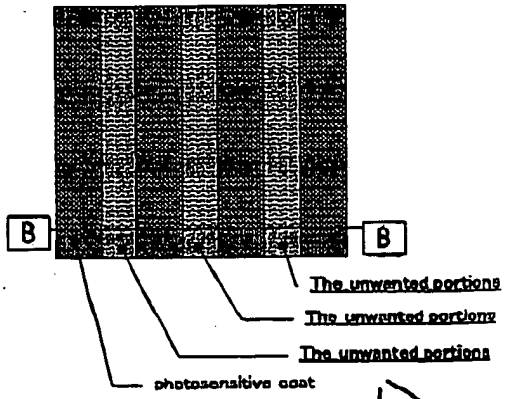
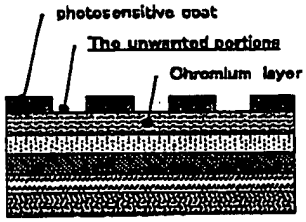
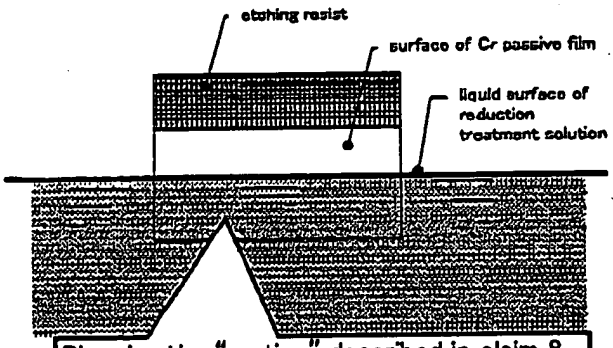
Attachment 3 Comparison between "a portion" of the present application and "an unwanted portion" of USP809

	Portion of the present application	Portion of disclosure of USP809
After resist patterning	 Section A-A	 USP809 (col. 3, lines 37-39) Showing the portion described "This selectively etches away the unwanted portions of the chromium layer".  Section B-B
Immersed state	 Showing the "portion" described in claim 8 of the present application, "(Currently amended) A method according to any one of claims 1 to 6, wherein the cathode electrolysis reduction step comprises dipping a portion of the metal film into an acidic reduction treatment solution containing a halogen ion".